Biosecurity audit and tailored grassland and facility biosecurity measures to reduce the occurrence of Rhodococcal infection in breeding centres

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Rhodococcus equi

Oral Presentations

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Background: *Rhodococcus equi* (*R.equi*) VapA+ is a facultative pathogen that could induce pneumonia in foals below 6 months of age. Rhodococcal infection may be severe and is a recognised threat to the equine breeding industry. Infected foals may require antibiotherapy for several weeks with associated issues such as side effects and/or bacterial resistance. To date, no vaccine is commercially available, and protection induced by hyperimmune plasma has limitations.
Objectives: To validate a tailored biosecurity approach to reduce disease occurrence in equine breeding centres/farms.
Study design: Proof of concept; field biosecurity audit, design/implementation of tailored biosecurity measures and longitudinal annual monitoring (up to 3 years).
Methods: 5 breeding centres (from 50 to 200 breeding mares) with a disease history ranging from no cases to almost 80% per year were selected. A biosecurity audit was conducted in each centre to determine existing measures. A tailored biosecurity programme (including grassland and facilities management, animal/human/vehicle flows etc.) was subsequently designed with owners and veterinarians to support/strengthen existing measures. Soil samples were semi-quantitatively analysed to identify areas with high concentration of *R. equi* VapA+.
Results: Bacterial analyses were successfully used to map "at risk" areas and to adapt foals' paddock allocation, animal movement flows and grassland management accordingly. The combination of measures such as regular disinfection protocols, faeces removal, annual reseeding, liming, watering and use of heavy sand, reduced disease occurrence in all previously affected centres when implemented (e.g. from 49 suspicious/confirmed cases prior to audit to 2 cases per year for 2 years). Audit and annual monitoring also increased general awareness about other equine infectious diseases.
Main limitations: The audit was standardised but implemented measures were centre-specific. Confirmation of results will require a larger number of centres and standardisation.
Conclusions: Tailored grassland and facility management could help to reduce the occurrence of Rhodococcal infection in the field.
Ethical animal research: No animal samples were taken.
Informed consent: Not applicable.
Competing interests: R. Paillot reports no competing interests. C. Vercken is providing commercial equine biosecurity services.
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12 | Changes over time in total IgG and vapA-specific IgG in mares and in their foals after *Rhodococcus equi* hyperimmune plasma administration

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Background: *Rhodococcus equi*-specific hyperimmune plasma (Re-HIP) is used prophylactically to prevent *R. equi* pneumonia. Changes over time of *R. equi*-specific antibodies in mares and foals remain poorly defined.
Objectives: 1) Evaluate the changes over time in total IgG and vapA-specific IgG after Re-HIP administration, 2) Compare foal results to those of the mare.
Study design: Pilot prospective study.
Methods: Serum was collected from mares (at foaling, 3 weeks, and 3 months after foaling) and their foals (24 h of life before Re-HIP, 48 h of life post 2 L of Re-HIP given IV, 3 weeks and 3 month of age). All Re-HIP bags were sampled. Total IgG and vapA-IgG were evaluated using ELISA. Repeated measures ANOVA (ANOVA on ranks) and t-test (Mann-Whitney test) were used for analysis.
Results: Neither IgG nor vapA-IgG change in mares over time. Foal IgG did not increase significantly after Re-HIP and decreased ($p < 0.05$) over time. Foal VapA-IgG increased after Re-HIP ($p < 0.001$) and returned to baseline values by 3 months of age. Total IgG did not differ between mares and foals before or after Re-HIP and was higher in mares by 3 weeks ($p = 0.04$) and 3 months ($p < 0.001$) after foaling. VapA-IgG was higher ($p = 0.2$) in mares before Re-HIP but was higher ($p < 0.05$) in foals at every timepoint thereafter. There was a large variation in total IgG (median 53, range 26-420 ng/mL) and vapA-IgG (median 27.4 x 10^3, range 19 to 41.5 x 10^3 EU) in HIP.
Main limitations: The number of animals included is limited. One Re-HIP product was evaluated.